Drinking Water Surveillance Program

PORT STANLEY WATER TREATMENT PLANT

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PORT STANLEY
WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT 1988

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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

PORT STANLEY WATER TREATMENT PLANT
1988 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 52 plants are being monitored.

The Port Stanley Water Treatment Plant is a conventional treatment plant which treats water from Lake Erie. The process consists of coagulation, flocculation, sedimentation, filtration, disinfection and fluoridation. This plant has a design capacity of 3.27 x 1000 m^3/day and serves a population of approximately 2,100.

Water samples from the raw and treated water at the plant were taken in June and November. The Port Stanley Water Treatment Plant was sampled for approximately 160 parameters. Parameters were divided into the following groups: Bacteriological, Inorganic and Physical (Laboratory Chemistry, Field Chemistry and Metals) and Organic (Chloroaromatics, Chlorophenols, Pesticides and PCB, Phenolics, Polynuclear Aromatic Hydrocarbons, Specific Pesticides and Volatiles).

A summary of results is shown in Table 1.

Inorganic and Physical parameters were below any health related ODWOs.

Of a total of approximately 110 Organic parameters tested for on a monthly basis, none exceeded health related guidelines.

During 1988 the results of the limited DWSP sampling indicated that the Port Stanley Water Treatment Plant produced good quality water.

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP

SUMMARY TABLE BY SCAN

SCAN	RAW TESTS	RAW POSITIVE	RAW %POSITIVE	TREATED TESTS	TREATED POSITIVE	TREATED %POSITIVE
BACTERIOLOGICAL	7	6	85	7	0	0
CHEMISTRY (FLD)	6	6	100	10	10	100
CHEMISTRY (LAB)	41	36	87	41	31	75
METALS	48	32	66	48	23	47
CHLOROAROMATICS	28	0	0	28	0	0
CHLOROPHENOLS	12	0	0	6	0	0
PAH	34	0	0	34	0	0
PESTICIDES & PCB	66	0	0	66	0	0
PHENOLICS	2	2	100	2	1	50
SPECIFIC PESTICIDES	56	0	0	50	0	0
VOLATILES	57	0	0	57	8	14
TOTAL	357	82		349	73	

NO HEALTH RELATED GUIDELINES WERE EXCEEDED

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

DRINKING WATER SURVEILLANCE PROGRAM

PORT STANLEY WATER TREATMENT PLANT
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INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 52 plants are being monitored.

The DWSP was initiated at the Port Stanley Water Treatment Plant in January 1986. Annual reports were published for 1986 (ISBN 0-7729-25652-8) and 1987 (ISSN 0839-8958).

This report contains information and results for 1988.

PLANT DESCRIPTION

The Port Stanley Water Treatment Plant is a conventional treatment plant that treats water from Lake Erie. The process consists of coagulation, flocculation, sedimentation, filtration , disinfection and fluoridation. This plant has a design capacity of 3.27 x 1000 m^3/day and serves a population of approximately 2,100.

The plant location is shown in Figure 1. Plant process details are

shown in Figure 2. General plant information is presented in Table 2.

METHODS

Water samples were obtained from two DWSP approved locations;

i) Plant Raw - The water originated from the lowlift chamber prior to chlorination and was sampled through a copper line. The sample tap is located near the lowlift pump.

ii) Plant Treated - The water originated from the filter discharge, after addition of all treatment chemicals, through a copper line. The sample tap is located in the plant laboratory.

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. The retention time was calculated by dividing the volume of water between two sampling points by the sample day flow. For example, if it was determined that the retention time within the plant was five hours then there would be a five hour interval between the raw and treated sampling.

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM

SITE LOCATION MAP

PORT STANLEY WATER TREATMENT PLANT

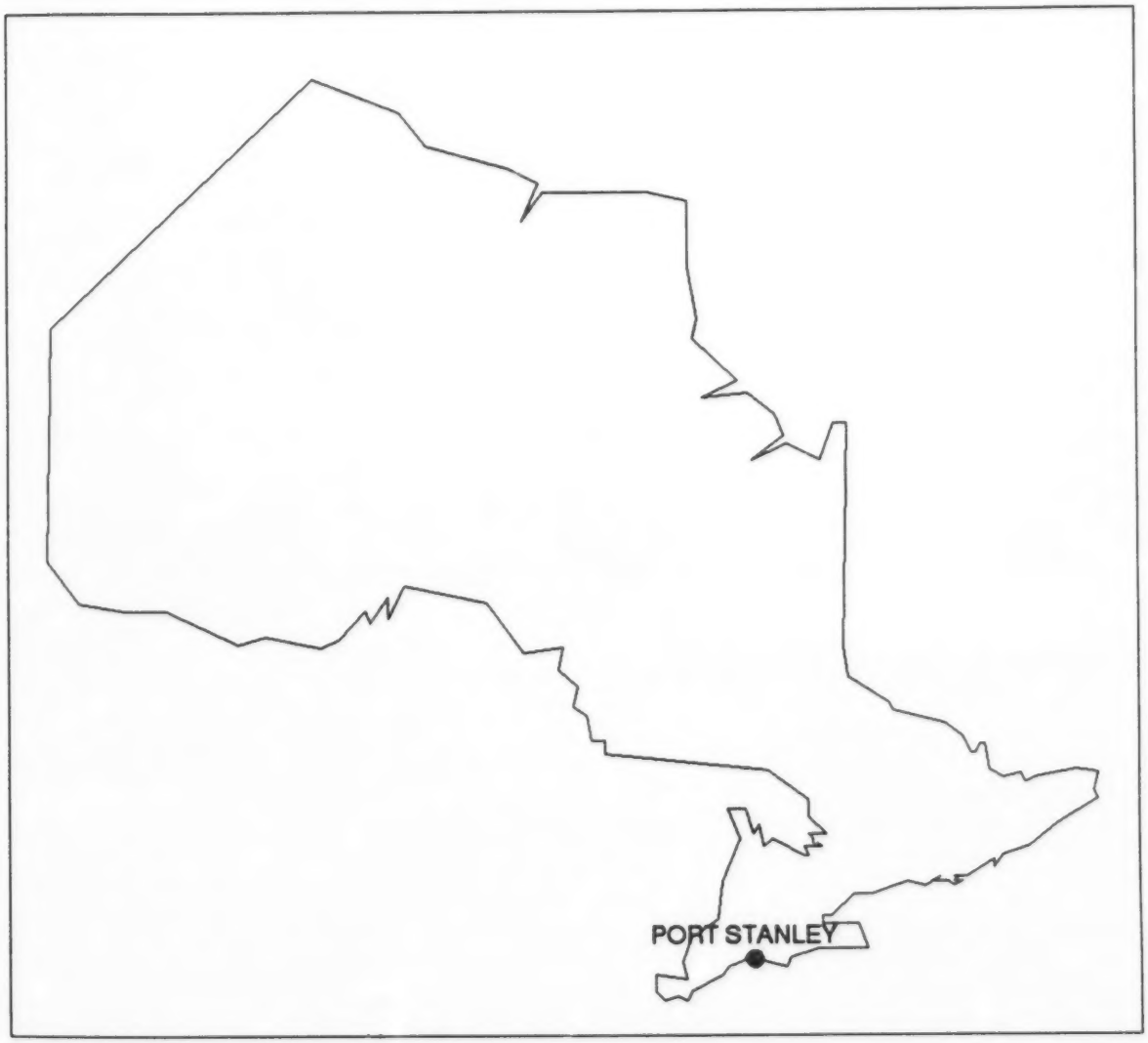

FIGURE 2

PORT STANLEY WATER TREATMENT PLANT

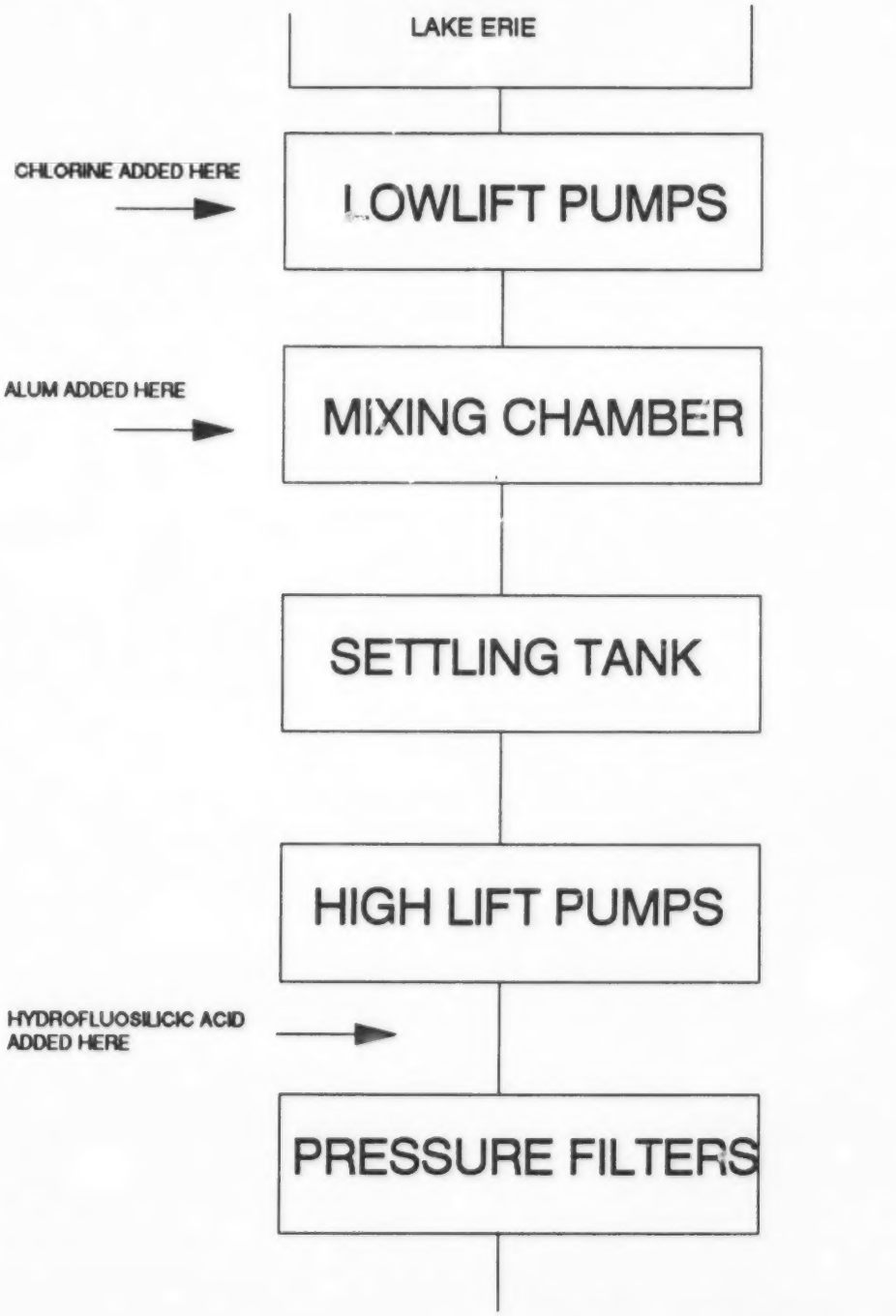

TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

GENERAL INFORMATION

PORT STANLEY WATER TREATMENT PLANT

LOCATION:	430 EDITH CAVELL BLVD PORT STANLEY, ONTARIO (519-782-3251)
SOURCE:	RAW WATER SOURCE - LAKE ERIE
DESIGN CAPACITY:	3.27 (1000 M^3/DAY)
OPERATION:	MUNICIPAL
PLANT SUPERINTENDENT:	J.L. BOLT
MINISTRY REGION:	SOUTHWESTERN
DISTRICT OFFICER:	C. MURRAY

MUNICIPALITY SERVED	POPULATION
PORT STANLEY	2,000
YARMOUTH TOWNSHIP	54
SOUTHWOULD	36

Stringent DWSP sampling protocols were followed to ensure that all samples were taken in the same manner.

Sample day flow, treatment chemical dosages and field chemistry measurements such as Turbidity, Chlorine Residuals, pH and Temperature were recorded on the day of sampling and were entered on the DWSP data base as submitted.

RESULTS

The Port Stanley Water Treatment Plant was sampled for approximately 160 parameters in June and November.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analysed by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment (MOE) laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it

cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 lists all parameters analysed on the DWSP.

Associated guidelines and detection limits are also supplied on tables 5 and 6. Parameters are listed alphabetically within each scan.

DISCUSSION

General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters, these are are currently under review. When an ODWO is not available guidelines/limits from other agencies are consulted. The Parameters Listing System (PALIS) recently published (ISBN 0-7729-4461-X) by the MOE catalogues and keeps current over 1750 guidelines for 650 parameters from agencies throughout the world.

Although some of the parameters measured on DWSP may be present in the raw and treated water as a result of pollution, many of the

compounds detected are naturally occurring or are treatment by-products.

Plant operational personnel address occurrences of taste and odour or biological water quality parameters. The DWSP does not assess these aspects of the water supply.

As stated under Results, traces do not indicate quantifiable values, as defined by established MOE Laboratory analytical reporting protocols. While they can be useful in trend analysis or confirmation of the presence of a specific contaminant that is repeatedly detected at these levels, the occasional finding of a trace level of a contaminant is not considered to be significant. **DISCUSSION OF GUIDELINES AND LIMITS THEREFORE, IS ONLY CONDUCTED ON POSITIVE RESULTS.**

Bacteriology

Results for the Bacteriology scan showed that there were no positive parameters for the two treated water samples.

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality; the routine monitoring program usually requires the taking of multiple samples in a given system. Routine bacteriological monitoring, as outlined in the ODWOs is carried out by the

operating authority.

Inorganic and Physical Parameters

Laboratory and Field Chemistry

The results for Laboratory Chemistry and Field Chemistry scans were below applicable health related ODWOs.

As part of the treatment plant process Hydrofluosilicic Acid is added to the treated water (Table 3). Where fluoridation is practised, the Fluoride concentration recommended in the ODWO is 1.2 mg/L, plus or minus 0.2 mg/L. This level was maintained as indicated by the fluoride results on Table 5 for both treated water samples.

The ODWO recommend a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters, to provide an acceptable balance between corrosion and incrustation. Water supplies with a hardness greater than 200 mg/L are considered poor, and would possess a tendency to form scale deposits and result in excessive soap consumption. Hardness values for the Port Stanley water were 144 mg/L and 159 mg/L.

The Langelier Index is used extensively in estimating the corrosion potential of water. An increasingly negative index indicates the increasing possibility of corrosion. It is considered sound

engineering practice to maintain a slightly positive Langelier Index. The Langelier Index for both treated water samples was positive.

Metals

The results reported for the Metal scan were below any applicable health related ODWOs.

Copper, Iron and Zinc levels were lower in the treated water as compared to the raw water. This is a result of the treatment process. The addition of alum as a coagulant to the raw water and the resulting coagulation/settling process has been shown to reduce the levels of most metals.

Organic Parameters

Chloroaromatics

The results of the Chloroaromatics group showed that no Chloroaromatics were detected.

Chlorophenols

The results of the Chlorophenol scan showed that no Chlorophenols were detected.

Pesticides and PCB (Polychlorinated Biphenyl)

Within the Pesticides and PCB scan no PCBs were detected and that

two pesticides were detected:

Alpha BHC

Lindane

There are several isomers of BHC (Benzene Hexachloride); gamma BHC is the active ingredient of the pesticide Lindane, while alpha BHC is the isomer most predominantly found in surface waters of the Great Lakes basin as indicated in results from other water supplies on DWSP.

Alpha BHC was detected at trace levels, twice in the raw water and in the treated water.

Lindane was detected at a trace level, once in the treated water.

Specific Pesticides

Within the Specific Pesticides scan no pesticides were detected.

Phenolics

The maximum desirable concentration of phenolic substances in drinking water is 2.0 ug/L. This limit has been set primarily to prevent the occurrence of undesirable tastes and odours, particularly in chlorinated water. Phenolics were detected at 1.2 ug/L and 2.0 ug/L in the raw water and at 1.2 ug/L and a trace amount in the treated water sampled. Phenolic compounds are present in the aquatic environment as a result of natural and/or

industrial processes.

Polynuclear Aromatic Hydrocarbons (PAH)

The results of the PAH scan showed that no PAHs were detected.

Volatiles

Within the Volatile scan five parameters, other than Trihalomethanes(THMs), were detected:

Toluene

Ethylbenzene

Meta-Xylene

Ortho-Xylene

Styrene

Toluene was detected at a trace level, twice in the treated water. The detection of toluene at low, trace levels is a laboratory artifact derived from the analytical methodology. The purge-and-trap analytical technique depends on the purging of the volatile organics in the water sample with helium gas onto a Tenax trapping column. The volatile materials are subsequently thermally desorbed, separated and quantified. Tenax, a toluene-like polymeric material, tends to decompose sporadically upon heating into toluene and other aromatic componenets (ethylbenzene and xylene) giving instrument blanks in the order of 0.05 ug/L.

The detected trace levels of Styrene are also considered to

be laboratory artifacts due to the outgassing of monomeric styrene from the polystyrene shipping containers. The sporadic background levels from this source are in the order of 0.05 ug/L.

Ethylbenzene was detected at trace levels, in the raw and treated water samples in June.

Meta-Xylene (M-Xylene) was detected at a trace level, once in the treated water.

Ortho-Xylene (O-Xylene) was detected at a trace level, once in the treated water.

The volatiles listed above are typically found on an occasional basis at other water supplies included on the DWSP usually at trace levels.

THMs are acknowledged to be produced during the water treatment process and will always occur in chlorinated surface waters. THMs are comprised of Chloroform, Chlorodibromomethane and Dichlorobromomethane with Bromoform occurring occasionally. Results are reported for the individual compounds as well as for total THMs.

Chloroform, Dichlorobromomethane, Chlorodibromomethane and Total THMs were always detected in the treated water. Bromoform was

detected at trace levels. Both Total THM occurrences, 42.2 ug/L and 55.3 ug/L, were well below the ODWO of 350 ug/L.

CONCLUSIONS

The Port Stanley Water Treatment Plant for the sample year of 1988 produced good quality water based on the results of the limited DWSP sampling. Results were consistent with those obtained from the DWSP in 1986 and 1987.

No health related guidelines for organic or inorganic parameters, were exceeded during 1988.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP SAMPLE DAY CONDITIONS FOR 1988

	SAMPLE DAY CONDITIONS		TREATMENT CHEMICAL DOSAGES (MG/L)		
			PRE-CHLORINATION	COAGULATION	FLUORIDATION
			CHLORINE	ALUM DRY	HYDROFLUOSILICIC ACID
DATE	RETENTION TIME(HRS)	FLOW (1000M3)			
JUN 28	8.0	2.3	3.32	7.30	5.48
NOV 22	14.0	1.3	2.63	6.53	1.40

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
BACTERIOLOGICAL	FECAL COLIFORM MF	2	1	0	.	.	.
	STANDRD PLATE CNT MF	1	1	0	2	0	0
	P/A BOTTLE	.	.	.	1	0	0
	TOTAL COLIFORM MF	2	2	0	2	0	0
	T COLIFORM BCKGRD MF	2	2	0	2	0	0
*TOTAL SCAN BACTERIOLOGICAL		7	6	0	7	0	0
*TOTAL GROUP BACTERIOLOGICAL		7	6	0	7	0	0
CHEMISTRY (FLD)	FLD CHLORINE (COMB)	.	.	.	2	2	0
	FLD CHLORINE FREE	.	.	.	2	2	0
	FLD CHLORINE (TOTAL)	.	.	.	2	2	0
	FLD PH	2	2	0	2	2	0
	FLD TEMPERATURE	2	2	0	2	2	0
	FLD TURBIDITY	2	2	0	.	.	.
*TOTAL SCAN CHEMISTRY (FLD)		6	6	0	10	10	0
CHEMISTRY (LAB)	ALKALINITY	2	2	0	2	2	0
	CALCIUM	2	2	0	2	2	0
	CYANIDE	2	0	0	2	0	0
	CHLORIDE	2	2	0	2	2	0
	COLOUR	2	1	0	2	0	1

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SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHEMISTRY (LAB)	CONDUCTIVITY	2	2	0	2	2	0
	FLUORIDE	2	2	0	2	2	0
	HARDNESS	2	2	0	2	2	0
	IONCAL	2	1	0	2	1	0
	LANGELIERS INDEX	2	2	0	2	2	0
	MAGNESIUM	2	2	0	2	2	0
	SODIUM	2	2	0	2	2	0
	AMMONIUM TOTAL	2	1	1	2	1	1
	NITRITE	2	2	0	2	1	1
	TOTAL NITRATES	2	2	0	2	2	0
	NITROGEN TOT KJELD	2	2	0	2	2	0
	PH	2	2	0	2	2	0
	PHOSPHORUS FIL REACT	2	2	0	2	1	1
	PHOSPHORUS TOTAL	2	2	0	2	0	2
	SULPHATE	1	1	0	1	1	0
	TURBIDITY	2	2	0	2	2	0
*TOTAL SCAN CHEMISTRY (LAB)		41	36	1	41	31	6
METALS	SILVER	2	0	0	2	0	1
	ALUMINUM	2	2	0	2	2	0
	ARSENIC	2	1	1	2	0	2
	BARIUM	2	2	0	2	2	0
	BORON	2	2	0	2	2	0

TABLE 4

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SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS	BERYLLIUM	2	0	1	2	0	2
	CADMIUM	2	0	0	2	0	1
	COBALT	2	1	1	2	0	2
	CHROMIUM	2	1	1	2	1	0
	COPPER	2	2	0	2	2	0
	IRON	2	2	0	2	0	2
	MERCURY	2	0	0	2	0	0
	MANGANESE	2	2	0	2	2	0
	MOLYBDENUM	2	2	0	2	2	0
	NICKEL	2	1	1	2	0	2
	LEAD	2	2	0	2	1	1
	ANTIMONY	2	2	0	2	1	1
	SELENIUM	2	0	2	2	0	2
	STRONTIUM	2	2	0	2	2	0
	TITANIUM	2	2	0	2	2	0
	THALLIUM	2	0	1	2	0	0
	URANIUM	2	2	0	2	2	0
	VANADIUM	2	2	0	2	0	2
	ZINC	2	2	0	2	2	0
*TOTAL SCAN METALS		48	32	8	48	23	18
*TOTAL GROUP INORGANIC & PHYSICAL		95	74	9	99	64	24
CHLOROAROMATICS	HEXACHLOROBUTADIENE	2	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHLOROAROMATICS	123 TRICHLOROBENZENE	2	0	0	2	0	0
	1234 T-CHLOROBENZENE	2	0	0	2	0	0
	1235 T-CHLOROBENZENE	2	0	0	2	0	0
	124 TRICHLOROBENZENE	2	0	0	2	0	0
	1245 T-CHLOROBENZENE	2	0	0	2	0	0
	135 TRICHLOROBENZENE	2	0	0	2	0	0
	HCB	2	0	0	2	0	0
	HEXACHLOROETHANE	2	0	0	2	0	0
	OCTACHLOROSTYRENE	2	0	0	2	0	0
	PENTACHLOROBENZENE	2	0	0	2	0	0
	236 TRICHLOROTOLUENE	2	0	0	2	0	0
	245 TRICHLOROTOLUENE	2	0	0	2	0	0
	26A TRICHLOROTOLUENE	2	0	0	2	0	0
*TOTAL SCAN CHLOROAROMATICS		28	0	0	28	0	0
CHLOROPHENOLS	234 TRICHLOROPHENOL	2	0	0	1	0	0
	2345 T-CHLOROPHENOL	2	0	0	1	0	0
	2356 T-CHLOROPHENOL	2	0	0	1	0	0
	245-TRICHLOROPHENOL	2	0	0	1	0	0
	246-TRICHLOROPHENOL	2	0	0	1	0	0
	PENTACHLOROPHENOL	2	0	0	1	0	0
*TOTAL SCAN CHLOROPHENOLS		12	0	0	6	0	0

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SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PAH	PHENANTHRENE	2	0	0	2	0	0
	ANTHRACENE	2	0	0	2	0	0
	FLUORANTHENE	2	0	0	2	0	0
	PYRENE	2	0	0	2	0	0
	BENZO(A)ANTHRACENE	2	0	0	2	0	0
	CHRYSENE	2	0	0	2	0	0
	DIMETH. BENZ(A)ANTHR	2	0	0	2	0	0
	BENZO(E) PYRENE	2	0	0	2	0	0
	BENZO(J) FLUORANTHEN	0	0	0	0	0	0
	BENZO(B) FLUORANTHEN	2	0	0	2	0	0
	PERYLENE	2	0	0	2	0	0
	BENZO(K) FLUORANTHEN	2	0	0	2	0	0
	BENZO(A) PYRENE	2	0	0	2	0	0
	BENZO(G,H,I) PERYLEN	2	0	0	2	0	0
	DIBENZO(A,H) ANTHRAC	2	0	0	2	0	0
	INDENO(1,2,3-C,D) PY	2	0	0	2	0	0
	BENZO(B) CHRYSENE	2	0	0	2	0	0
	ANTHANTHRENE	0	0	0	0	0	0
	CORONENE	2	0	0	2	0	0
*TOTAL SCAN PAH		34	0	0	34	0	0
PESTICIDES & PCB	ALDRIN	2	0	0	2	0	0
	ALPHA BHC	2	0	2	2	0	2

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SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PESTICIDES & PCB	BETA BHC	2	0	0	2	0	0
	LINDANE	2	0	0	2	0	1
	ALPHA CHLORDANE	2	0	0	2	0	0
	GAMMA CHLORDANE	2	0	0	2	0	0
	DIELDRIN	2	0	0	2	0	0
	METHOXYCHLOR	2	0	0	2	0	0
	ENDOSULFAN 1	2	0	0	2	0	0
	ENDOSULFAN II	2	0	0	2	0	0
	ENDRIN	2	0	0	2	0	0
	ENDOSULFAN SULPHATE	2	0	0	2	0	0
	HEPTACHLOR EPOXIDE	2	0	0	2	0	0
	HEPTACHLOR	2	0	0	2	0	0
	MIREX	2	0	0	2	0	0
	OXYCHLORDANE	2	0	0	2	0	0
	OPDDT	2	0	0	2	0	0
	PCB	2	0	0	2	0	0
	DDD	2	0	0	2	0	0
	PPDDE	2	0	0	2	0	0
	PPDDT	2	0	0	2	0	0
	AMETRINE	2	0	0	2	0	0
	ATRAZINE	2	0	0	2	0	0
	ATRATONE	2	0	0	2	0	0
	CYANAZINE	2	0	0	2	0	0
	DES ETHYL ATRAZINE	1	0	0	1	0	0
	DES ETHYL SIMAZINE	1	0	0	1	0	0

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SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PESTICIDES & PCB	PROMETONE	2	0	0	2	0	0
	PROPAZINE	2	0	0	2	0	0
	PROMETRYNE	2	0	0	2	0	0
	METRIBUZIN	2	0	0	2	0	0
	SIMAZINE	2	0	0	2	0	0
	ALACHLOR	2	0	0	2	0	0
	METOLACHLOR	2	0	0	2	0	0
*TOTAL SCAN PESTICIDES & PCB		66	0	2	66	0	3
PHENOLICS	PHENOLICS	2	2	0	2	1	1
*TOTAL SCAN PHENOLICS		2	2	0	2	1	1
SPECIFIC PESTICIDES	TOXAPHENE	0	0	0	0	0	0
	2,4,5-T	2	0	0	1	0	0
	2,4-D	2	0	0	1	0	0
	2,4-DB	2	0	0	1	0	0
	2,4 D PROPIONIC ACID	2	0	0	1	0	0
	DICAMBA	2	0	0	1	0	0
	PICHLORAM	0	0	0	0	0	0
	SILVEX	2	0	0	1	0	0
	DIAZINON	2	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY

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SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
SPECIFIC PESTICIDES	DICHLOROVOS	2	0	0	2	0	0
	CHLORPYRIFOS	2	0	0	2	0	0
	ETHION	2	0	0	2	0	0
	AZINPHOS-METHYL	0	0	0	0	0	0
	MALATHION	2	0	0	2	0	0
	MEVINPHOS	2	0	0	2	0	0
	METHYL PARATHION	2	0	0	2	0	0
	METHYLTRITHION	2	0	0	2	0	0
	PARATHION	2	0	0	2	0	0
	PHORATE	2	0	0	2	0	0
	RELDAN	2	0	0	2	0	0
	RONNEL	2	0	0	2	0	0
	AMINOCARB	0	0	0	0	0	0
	BENOMYL	2	0	0	2	0	0
	BUX	2	0	0	2	0	0
	CARBOFURAN	2	0	0	2	0	0
	CICP	2	0	0	2	0	0
	DIALLATE	2	0	0	2	0	0
	EPTAM	2	0	0	2	0	0
	IPC	2	0	0	2	0	0
	PROPOXUR	2	0	0	2	0	0
	CARBARYL	2	0	0	2	0	0
	BUTYLATE	2	0	0	2	0	0
*TOTAL SCAN SPECIFIC PESTICIDES		56	0	0	50	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
VOLATILES	BENZENE	2	0	0	2	0	0
	TOLUENE	2	0	0	2	0	2
	ETHYLBENZENE	2	0	1	2	0	1
	P-XYLENE	2	0	0	2	0	0
	M-XYLENE	2	0	0	2	0	1
	O-XYLENE	2	0	0	2	0	1
	STYRENE	1	0	1	1	0	0
	1,1 DICHLOROETHYLENE	2	0	0	2	0	0
	METHYLENE CHLORIDE	2	0	0	2	0	0
	T1,2DICHLOROETHYLENE	2	0	0	2	0	0
	1,1 DICHLOROETHANE	2	0	0	2	0	0
	CHLOROFORM	2	0	0	2	2	0
	111, TRICHLOROETHANE	2	0	0	2	0	0
	1,2 DICHLOROETHANE	2	0	0	2	0	0
	CARBON TETRACHLORIDE	2	0	0	2	0	0
	1,2 DICHLOROPROPANE	2	0	0	2	0	0
	TRICHLOROETHYLENE	2	0	0	2	0	0
	DICHLOROBROMOMETHANE	2	0	0	2	2	0
	112 TRICHLOROETHANE	2	0	0	2	0	0
	CHLORODIBROMOMETHANE	2	0	0	2	2	0
	T-CHLOROETHYLENE	2	0	0	2	0	0
	BROMOFORM	2	0	0	2	0	2
	1122 T-CHLOROETHANE	2	0	0	2	0	0
	CHLOROBENZENE	2	0	0	2	0	0
	1,4 DICHLOROBENZENE	2	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
VOLATILES	1,3 DICHLOROBENZENE	2	0	0	2	0	0
	1,2 DICHLOROBENZENE	2	0	0	2	0	0
	ETHLYENE DIBROMIDE	2	0	0	2	0	0
	TOTL TRIHALOMETHANES	2	0	0	2	2	0
*TOTAL SCAN VOLATILES		57	0	2	57	8	7
*TOTAL GROUP ORGANIC		255	2	4	243	9	11
TOTAL		357	82	13	349	73	35

KEY TO TABLE 5 and 6

A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
1*. MAC for Bacteriological Analyses
Poor water quality is indicated when :
- total coliform counts > 0 < 5
- P/A Bottle Test is present after 48 hours
- Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
- Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
- Standard Plate Count should not exceed 500 organisms per ml at 35 ^{0}C within 48 hours

2. Interim Maximum Acceptable Concentration (IMAC)
3. Maximum Desirable Concentration (MDC)
4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness >200 mg/L are considered poor and those in excess of 500 mg/L are unacceptable.

B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO) (for xy enes, the AO is a total)

C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV

D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria

F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissable Concentration (MADC)

G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

H USSR MAXIMUM PERMISSIBLE CONCENTRATION

I NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

INTERPRETATION OF DATA

The interpretation of analytical results that are obtained from measurements near the limit of detection of the measurement process is subject to greater uncertainty than those at higher concentrations. The principle areas of concern relate to whether the substance has actually been detected, whether it has been properly identified, and whether it is an artifact of the measurement process. In other words, false positives can be caused by the instrumentation or the test procedures used, when in fact these compounds are not present in the sample.

There are several methods to treat data from such measurements:
1. Exclude the low-level data because of this uncertainty factor. However, studies of long-term environmental trends and modelling may be adversely affected by exclusion of such data.
2. Qualify these data so the user is aware of the greater uncertainty associated with their use.

For the Drinking Water Surveillance Program, measurements near the limit of detection of the measurement process are reported qualified by the code "<T". Results quantified by "W" indicate a zero measurement. These results are reported for purposes of modelling and long-term trend analysis and no significance should be attributed to a single determination of a substance below "T" (a single determination may well be a false positive). Repeat analysis or additional data are needed before it can be stated with certainty that the substance in question was truly present. On the other hand, it is less likely that repeated detection of a substance at or near the limit of detection at a specific location is solely due to an artifact in the measurement system, and more likely represents a true positive. However the average of such data is still only an estimate of the amount of substance present subject to the possible biases of the method used.

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurable Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!AW	No Data: Analysis Withdrawn
!CR	No Data: Could Not Confirm By Reanalysis
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident

!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!QU	No Data: Quality Control Unacceptable
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RE	No Data: Received Empty
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample
RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant
UAL	Unreliable: Sample Age Exceeds Normal Limit
UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
UIN	Unreliable: Indeterminant Interference
XP	Positive After X Number of Hours
T# (T06)	Result Taken After # Hours

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
BACTERIOLOGICAL			
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = 0 (A1)
JUN	0	.	
NOV	60 T48	.	
STANDRD PLATE CNT MF (CT/ML)		DET'N LIMIT = 0	GUIDELINE = 500/ML (A1)
JUN	2400 >	0	
NOV	.	2 <=>	
P/A BOTTLE ( )		DET'N LIMIT = 0	GUIDELINE = 0 (A1*)
JUN	.	0	
TOTAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = 5/100ML(A1)
JUN	800 A3C	0	
NOV	1700 T48	0 T24	
T COLIFORM BCKGRD MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = N/A
JUN	42000	0	
NOV	8600 T48	0 T24	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
CHEMISTRY (FLD)			
FLD CHLORINE (COMB) ( )		DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.	.300	
NOV	.	.300	
FLD CHLORINE FREE ( )		DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.	1.000	
NOV	.	1.000	
FLD CHLORINE (TOTAL) ( )		DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.	1.300	
NOV	.	1.300	
FLD PH (DIMNSLESS)		DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
JUN	7.200	6.900	
NOV	7.900	7.000	
FLD TEMPERATURE (DEG.C)		DET'N LIMIT = N/A	GUIDELINE = 15 (A1)
JUN	13.000	13.000	
NOV	8.000	8.000	
FLD TURBIDITY (FTU)		DET'N LIMIT = N/A	GUIDELINE = 1.0 (A1)
JUN	20.000	.	
NOV	80.000	.	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED		
CHEMISTRY (LAB)				
ALKALINITY (MG/L)			DET'N LIMIT = .200	GUIDELINE = 30-500 (A4)
JUN	106.700	106.700		
NOV	106.100	110.700		
CALCIUM (MG/L)			DET'N LIMIT = .100	GUIDELINE = 100 (F2)
JUN	36.600	41.600		
NOV	39.000	46.600		
CHLORIDE (MG/L)			DET'N LIMIT = .200	GUIDELINE = 250 (A3)
JUN	14.100	19.400		
NOV	14.300	19.400		
COLOUR (HZU)			DET'N LIMIT = .5	GUIDELINE = 5.0 (A3)
JUN	BDL	.500 <T		
NOV	3.500	BDL		
CONDUCTIVITY (UMHO/CM)			DET'N LIMIT = 1	GUIDELINE = 400 (F2)
JUN	296	338		
NOV	285	349		
FLUORIDE (MG/L)			DET'N LIMIT = .01	GUIDELINE = 2.400 (A1)
JUN	.120	1.110		
NOV	.120	1.180		
HARDNESS (MG/L)			DET'N LIMIT = .500	GUIDELINE = 80-100 (A4)
JUN	127.000	144.000		
NOV	135.000	159.000		
IONCAL (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.000 NAF	.000 NAF		
NOV	1.040	4.080		
LANGELIERS INDEX (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.404 NAF	.392 NAF		
NOV	.394	.266		
MAGNESIUM (MG/L)			DET'N LIMIT = .050	GUIDELINE = 30 (F2)
JUN	8.700	9.800		
NOV	9.200	10.300		

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
SODIUM (MG/L)			DET'N LIMIT = .200 GUIDELINE = 200 (C3)
JUN	7.800	9.800	
NOV	7.800	10.000	
AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002 GUIDELINE = .05 (F2)
JUN	.060	.006 <T	
NOV	.004 <T	.014	
NITRITE (MG/L)			DET'N LIMIT = 0.001 GUIDELINE = 1.000 (A1)
JUN	.014	.001 <T	
NOV	.019	.005	
TOTAL NITRATES (MG/L)			DET'N LIMIT = .020 GUIDELINE = 10.000 (A1)
JUN	.130	.160	
NOV	.215	.305	
NITROGEN TOT KJELD (MG/L)			DET'N LIMIT = .020 GUIDELINE = N/A
JUN	.320	.170	
NOV	.290	.160	
PH (DMNSLESS)			DET'N LIMIT = N/A GUIDELINE = 6.5-8.5(A4)
JUN	8.250	8.190	
NOV	8.210	8.000	
PHOSPHORUS FIL REACT (MG/L)			DET'N LIMIT = .0005 GUIDELINE = N/A
JUN	.011	.002 <T	
NOV	.033	.007	
PHOSPHORUS TOTAL (MG/L)			DET'N LIMIT = .002 GUIDELINE = .40 (F2)
JUN	.028	.006 <T	
NOV	.062	.004 <T	
SULPHATE ( )			DET'N LIMIT = .200 GUIDELINE = 500. (A3)
NOV	22.620	32.920	
TURBIDITY (FTU)			DET'N LIMIT = .02 GUIDELINE = 1.00 (A1)
JUN	15.500	.260	
NOV	69.000	.890	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
METALS			
SILVER (UG/L)		DET'N LIMIT = .020	GUIDELINE = 50. (A1)
JUN	BDL	BDL	
NOV	BDL	.040 <T	
ALUMINUM (UG/L)		DET'N LIMIT = .050	GUIDELINE = 100.(A4)
JUN	197.200	63.800	
NOV	313.200	63.800	
ARSENIC (UG/L)		DET'N LIMIT = 0.050	GUIDELINE = 50.0 (A1)
JUN	.950 <T	.720 <T	
NOV	1.100	.730 <T	
BARIUM (UG/L)		DET'N LIMIT = 0.020	GUIDELINE = 1000. (A1)
JUN	27.000	24.000	
NOV	28.000	26.000	
BORON (UG/L)		DET'N LIMIT = 0.200	GUIDELINE = 5000. (A1)
JUN	21.000	21.000	
NOV	35.000	87.000	
BERYLLIUM (UG/L)		DET'N LIMIT = 0.010	GUIDELINE = .20 (H)
JUN	BDL	.030 <T	
NOV	.100 <T	.120 <T	
CADMIUM (UG/L)		DET'N LIMIT = 0.050	GUIDELINE = 5.000 (A1)
JUN	BDL	BDL	
NOV	BDL	.090 <T	
COBALT (UG/L)		DET'N LIMIT = 0.020	GUIDELINE = 1000 (H)
JUN	.130 <T	.030 <T	
NOV	4.900	.100 <T	
CHROMIUM (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 50. (A1)
JUN	.320 <T	BDL	
NOV	2.200	6.700	
COPPER (UG/L)		DET'N LIMIT = .100	GUIDELINE = 1000 (A3)
JUN	4.800	1.900	
NOV	6.700	1.900	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP 1988

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	TREATED		
IRON (UG/L)			DET'N LIMIT = 4.000	GUIDELINE = 300. (A3)
JUN	260.000	24.000 <T		
NOV	630.000	6.200 <T		
MANGANESE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 50.0 (A3)
JUN	11.000	.910		
NOV	46.000	.690		
MOLYBDENUM (UG/L)			DET'N LIMIT = 0.020	GUIDELINE = 500 (H)
JUN	1.200	1.500		
NOV	.720	1.500		
NICKEL (UG/L)			DET'N LIMIT = 0.100	GUIDELINE = 50. (F3)
JUN	.770 <T	1.000 <T		
NOV	2.400	.110 <T		
LEAD (UG/L)			DET'N LIMIT = 0.050	GUIDELINE = 50. (A1)
JUN	.490	.680		
NOV	1.500	.180 <T		
ANTIMONY (UG/L)			DET'N LIMIT = .050	GUIDELINE = 146. (D4)
JUN	.230	.190 <T		
NOV	3.200	.530		
SELENIUM (UG/L)			DET'N LIMIT = 0.200	GUIDELINE = 10. (A1)
JUN	1.200 <T	2.800 <T		
NOV	1.700 <T	2.700 <T		
STRONTIUM (UG/L)			DET'N LIMIT = .050	GUIDELINE = 2000.(H)
JUN	160.000	190.000		
NOV	160.000	190.000		
TITANIUM (UG/L)			DET'N LIMIT = .050	GUIDELINE = N/A
JUN	9.600	3.100		
NOV	13.000	6.000		
THALLIUM (UG/L)			DET'N LIMIT = .010	GUIDELINE = 13. (D4)
JUN	BDL	BDL		
NOV	.020 <T	BDL		
URANIUM (UG/L)			DET'N LIMIT = .020	GUIDELINE = 20. (A2)

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
VANADIUM (UG/L)		DET'N LIMIT = .050	GUIDELINE = 100 (N)
JUN	.400	.320	
NOV	.460	.340	
VANADIUM (UG/L)		DET'N LIMIT = .050	GUIDELINE = 100 (N)
JUN	.510	.150 <T	
NOV	1.000	.260 <T	
ZINC (UG/L)		DET'N LIMIT = .001	GUIDELINE = 5000. (A3)
JUN	17.000	2.200	
NOV	17.000	2.700	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
PESTICIDES & PCB			
ALPHA BHC (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 700 (G)
JUN	1.000 <T	1.000 <T	
NOV	1.000 <T	1.000 <T	
LINDANE (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 4000 (A1)
JUN	BDL	BDL	
NOV	BDL	1.000 <T	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
PHENOLICS (UG/L)	PHENOLICS	DET'N LIMIT = 0.2	GUIDELINE = 2.00 (A3)
JUN	1.200	.600 <T	
NOV	2.000	1.200	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP 1988

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	TREATED		
VOLATILES				
TOLUENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 24.0 (B4)
JUN	BDL	.100 <T		
NOV	BDL	.050 <T		
ETHYLBENZENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 2.4 (B4)
JUN	.050 <T	.050 <T		
NOV	BDL	BDL		
m-XYLENE (UG/L)			DET'N LIMIT = .100	GUIDELINE = 300 (B4)
JUN	BDL	.100 <T		
NOV	BDL	BDL		
O-XYLENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 300 (B4)
JUN	BDL	.050 <T		
NOV	BDL	BDL		
STYRENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 46.5 (D2)
NOV	.150 <T	BDL		
CHLOROFORM (UG/L)			DET'N LIMIT = .100	GUIDELINE = 350 (A1+)
JUN	BDL	22.900		
NOV	BDL	32.100		
DICHLOROBROMOMETHANE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 350 (A1+)
JUN	BDL	12.200		
NOV	BDL	15.100		
CHLORODIBROMOMETHANE (UG/L)			DET'N LIMIT = .100	GUIDELINE = 350 (A1+)
JUN	BDL	6.700		
NOV	BDL	7.500		
BROMOFORM (UG/L)			DET'N LIMIT = .200	GUIDELINE = 350 (A1+)
JUN	BDL	.400 <T		
NOV	BDL	.600 <T		
TOTL TRIHALOMETHANES (UG/L)			DET'N LIMIT = .500	GUIDELINE = 350 (A1)
JUN	BDL	42.200		
NOV	BDL	55.300		

Table 6

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
STANDARD PLATE COUNT MEMBRANE FILTRATION	CT/ML	0	500/ML(A1)
P/A BOTTLE		0	0 (A1*)
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100mL(A1)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
CHLOROAROMATICS			
HEXACHLOROBUTADIENE	NG/L	1.000	450. (D4)
1,2,3-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,4-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.000	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.000	10000 (D4)
HEXACHLOROBENZENE	NG/L	1.0	10. (C1)
HEXACHLOROETHANE	NG/L	1.000	1900. (D4)
OCTACHLOROSTYRENE	NG/L	1.000	N/A
PENTACHLOROBENZENE	NG/L	1.000	74000 (D4)
2,3,6-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,6,A-TRICHLOROTOLUENE	NG/L	5.000	N/A
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	50.	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	50.	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	50.	N/A
2,4,5-TRICHLOROPHENOL	NG/L	50.	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	50.	5000. (B1)
PENTACHLOROPHENOL	NG/L	50.	60000. (B1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD PH	DMSNLESS	N/A	6.5-8.5(A4)
FIELD TEMPERATURE	°C	N/A	<15 °C(A1)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	.200	30-500(A4)
CALCIUM	MG/L	.100	100. (F2)
CYANIDE	MG/L	.001	.20(A1)
CHLORIDE	MG/L	.200	250. (A3)
COLOUR	TCU	.5	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.	400. (F2)
FLUORIDE	MG/L	.01	2.4 (A1)
HARDNESS	MG/L	.50	80-100(A4)
MAGNESIUM	MG/L	.05	30. (F2)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
NITRITE	MG/L	.001	1.0 (A1)
TOTAL NITRATES	MG/L	.02	10. (A1)
NITROGEN TOTAL KJELDAHL	MG/L	.02	N/A
PH	DMSNLESS	N/A	6.5-8.5(A4)
PHOSPHORUS FIL REACT	MG/L	.0005	N/A
PHOSPHORUS TOTAL	MG/L	.002	.40(F2)
TOTAL SOLIDS	MG/L	1.	500. (A3)
TURBIDITY	FTU	.02	1.0 (A1)
METALS			
ALUMINUM	UG/L	.050	100. (A4)
ANTIMONY	UG/L	.050	146. (D4)
ARSENIC	UG/L	.050	50. (A1)
BARIUM	UG/L	.020	1000. (A1)
BORON	UG/L	.200	5000. (A1)
BERYLLIUM	UG/L	.010	0.20 (H)
CADMIUM	UG/L	.050	5.0 (A1)
COBALT	UG/L	.020	1000. (H)
CHROMIUM	UG/L	.100	50. (A1)
COPPER	UG/L	.100	1000. (A3)
IRON	UG/L	5.0	300. (A3)
MERCURY	UG/L	.01	1.0 (A1)
MANGANESE	UG/L	.050	50. (A3)
MOLYBDENUM	UG/L	.020	500. (H)
NICKEL	UG/L	.100	50. (F3)
LEAD	UG/L	.020	50. (A1)
SELENIUM	UG/L	.200	10. (A1)
SILVER	UG/L	.020	50. (A1)
STRONTIUM	UG/L	.100	2000. (H)
THALLIUM	UG/L	.010	13. (D4)
TITANIUM	UG/L	.100	N/A
URANIUM	UG/L	.020	20. (A2)
VANADIUM	UG/L	.020	100. (H)
ZINC	UG/L	.020	5000. (A3)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	.2	2.0 (A3)
PESTICIDES & PCB			
ALDRIN	NG/L	1.0	700. (A1)
AMETRINE	NG/L	50.	300000. (D3)
ATRAZINE	NG/L	50.	60000. (B3)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700. (G)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300. (G)
GAMMA HEXACHLOROCYCLOHEXANE(LINDANE)	NG/L	1.0	4000. (A1)
ALPHA CHLORDANE	NG/L	2.0	7000. (A1)
GAMMA CHLORDANE	NG/L	2.0	7000. (A1)
BLADEX	NG/L	100.	10000. (B3)
DIELDRIN	NG/L	2.0	700. (A1)
METHOXYCHLOR	NG/L	5.0	100000. (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000. (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	4.0	74000. (D4)
ENDRIN	NG/L	4.0	200. (A1)
ENDOSULFAN SULPHATE(THIODAN SULPHATE)	NG/L	4.0	N/A
HEPTACHLOR EPOXIDE	NG/L	1.0	3000. (A1)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
HEPTACHLOR	NG/L	1.0	3000.	(A1)
METOLACHLOR	NG/L	500.	50000.	(B3)
MIREX	NG/L	5.0	N/A	
OXYCHLORDANE	NG/L	2.0	N/A	
O,P-DDT	NG/L	5.0	30000.	(A1)
PCB	NG/L	20.0	3000.	(A2)
O,P-DDD	NG/L	5.0	N/A	
PPDDE	NG/L	1.0	30000.	(A1)
PPDDT	NG/L	5.0	30000.	(A1)
ATRATONE	NG/L	50.	N/A	
ALACHLOR	NG/L	500.	35000.	(D2)
PROMETONE	NG/L	50.	52500.	(D3)
PROPAZINE	NG/L	50.	16000.	(D2)
PROMETRYNE	NG/L	50.	1000.	(B3)
SENCOR (METRIBUZIN)	NG/L	100.	80000.	(B2)
SIMAZINE	NG/L	50.	10000.	(B3)
POLYAROMATIC HYDROCARBONS				
PHENANTHRENE	NG/L	10.0	N/A	
ANTHRACENE	NG/L	1.0	N/A	
FLUORANTHENE	NG/L	20.0	42000.	(D4)
PYRENE	NG/L	20.0	N/A	
BENZO(A)ANTHRACENE	NG/L	20.0	N/A	
CHRYSENE	NG/L	50.0	N/A	
DIMETHYL BENZO(A)ANTHRACENE	NG/L	5.0	N/A	
BENZO(E)PYRENE	NG/L	50.0	N/A	
BENZO(B)FLUORANTHENE	NG/L	10.0	N/A	
PERYLENE	NG/L	10.0	N/A	
BENZO(K)FLUORANTHENE	NG/L	1.0	N/A	
BENZO(A)PYRENE	NG/L	5.0	10.	(B1)
BENZO(G,H,I)PERYLENE	NG/L	20.0	N/A	
DIBENZO(A,H)ANTHRACENE	NG/L	10.0	N/A	
INDENO(1,2,3-C,D)PYRENE	NG/L	20.0	N/A	
BENZO(B)CHRYSENE	NG/L	2.0	N/A	
CORONENE	NG/L	10.0	N/A	
SPECIFIC PESTICIDES				
TOXAPHENE	NG/L	N/A	5000.	(A1)
2,4,5-TRICHLOROBUTYRIC ACID (2,4,5-T)	NG/L	50.	280000.	(B1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000.	(A1)
2,4-DICHLORORPHENOXYBUTYRIC ACID	NG/L	200.	18000.	(B3)
2,4-D PROPIONIC ACID	NG/L	100.	N/A	
DICAMBA	NG/L	100.	87000.	(B3)
PICHLORAM	NG/L	100.	2450000.	(D3)
SILVEX (2,4,5-TP)	NG/L	50.	10000.	(A1)
DIAZINON	NG/L	20.	14000.	(A1)
DICHLOROVOS	NG/L	20.	N/A	
DURSBAN	NG/L	20.	N/A	
ETHION	NG/L	20.	35000.	(G)
GUTHION	NG/L	N/A	N/A	
MALATHION	NG/L	20.	160000.	(G)
MEVINPHOS	NG/L	20.	N/A	
METHYL PARATHION	NG/L	50.	7000.	(B3)
METHYLTRITHION	NG/L	20.	N/A	
PARATHION	NG/L	20.	35000.	(B1)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
PHORATE (THIMET)	NG/L	20.	35. (D2)
RELDAN	NG/L	20.	N/A
RONNEL	NG/L	20.	N/A
AMINOCARB	NG/L	N/A	N/A
BENONYL	NG/L	N/A	N/A
BUX (METALKAMATE)	NG/L	2000.	N/A
CARBOFURAN	NG/L	2000.	18000. (D3)
CICP (CHLORPROPHAM)	NG/L	2000.	350000. (G)
DIALLATE	NG/L	2000.	30000. (H)
EPTAM	NG/L	2000.	N/A
IPC	NG/L	2000.	N/A
PROPOXUR (BAYGON)	NG/L	2000.	90000. (G)
SEVIN (CARBARYL)	NG/L	200.	70000. (A1)
SUTAN (BUTYLATE)	NG/L	2000.	245000. (D3)
VOLATILES			
BENZENE	UG/L	.050	5.0 (B1)
TOLUENE	UG/L	.050	24.0 (B4)
ETHYLBENZENE	UG/L	.050	2.4 (B4)
PARA-XYLENE	UG/L	.100	300. (B4)
META-XYLENE	UG/L	.100	300. (B4)
ORTHO-XYLENE	UG/L	.050	300. (B4)
1,1-DICHLOROETHYLENE	UG/L	.100	7.0 (D1)
ETHLYENE DIBROMIDE	UG/L	.05	50. (G)
METHYLENE CHLORIDE	UG/L	.500	1750. (D3)
TRANS-1,2-DICHLOROETHYLENE	UG/L	.100	350. (D3)
1,1-DICHLOROETHANE	UG/L	.100	N/A
CHLOROFORM	UG/L	.100	350. (A1+)
1,1,1-TRICHLOROETHANE	UG/L	.020	200. (D1)
1,2-DICHLOROETHANE	UG/L	.050	5.0 (D1)
CARBON TETRACHLORIDE	UG/L	.200	5.0 (D1)
1,2-DICHLOROPROPANE	UG/L	.050	10.0 (G)
TRICHLOROETHYLENE	UG/L	.100	5.0 (D1)
DICHLOROBROMOMETHANE	UG/L	.050	350. (A1+)
1,1,2-TRICHLOROETHANE	UG/L	.050	.60(D4)
CHLORODIBROMOMETHANE	UG/L	.100	350. (A1+)
TETRACHLOROETHYLENE	UG/L	.050	10.0 (C2)
BROMOFORM	UG/L	.200	350. (A1+)
1,1,2,2-TETRACHLOROETHANE	UG/L	.050	0.17(D4)
CHLOROBENZENE	UG/L	.100	1510. (D3)
1,4-DICHLOROBENZENE	UG/L	.100	5.0 (B1)
1,3-DICHLOROBENZENE	UG/L	.100	130. (G)
1,2-DICHLOROBENZENE	UG/L	.050	200. (B1)
TRIFLUOROCHLOROTOLUENE	UG/L	.100	N/A
TOTAL TRIHALOMETHANES	UG/L	.500	350. (A1)
STYRENE	UG/L	.05	46.5 (D2)